

Analytical Biochemistry

An International Journal

EDITOR: *Alvin Nason*

EDITORIAL BOARD:

Ray Ackers
Norman G. Anderson
Ado Antonini
Robert Ashwell
H. Barker
Israel P. Bessman
Leon Black
Robert M. Bock
Robert L. Bowman
Craig Brand
A. Braunstein
Robert H. Burris
Levin Calvin
Thomas Chrambach
Jack Eisenberg, Jr.
Jacques R. Fresco
Robert Ginsburg
Gunsalus
Lynn O. Halvorson
Yasu Hayaishi

Edward C. Heath
Leslie Hellerman
C. H. W. Hirs
Evan C. Horning
Rollin D. Hotchkiss
Walter L. Hughes
William B. Jakoby
Nathan O. Kaplan
Ephraim Katchalski
Irving Klotz
Luis F. Leloir
Oliver H. Lowry
Feodor Lynen
Brian J. McCarthy
Donald McCormick
William D. McElroy
Vincent Massey
Alan H. Mehler
Bruce Merrifield

Marshall Nirenberg
Kazuo Okunuki
Sarah Ratner
Alexander Rich
David Rodbard
Gerhard Schmidt
Michael Sela
Esmond E. Snell
Herbert A. Sober
Sol Spiegelman
Paul K. Stumpf
Charles A. Thomas, Jr.
Sidney Udenfriend
Bert L. Vallee
Samuel B. Weiss
Theodor Wieland
George Wolf
W. A. Wood
Lemuel D. Wright
David A. Yphantis

VOLUME 68
1975

ACADEMIC PRESS
New York and London



A Subsidiary of Harcourt Brace Jovanovich, Publishers

Copyright © 1975 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

CONTENTS OF VOLUME 68

NUMBER 1, SEPTEMBER 1975

ADELIO RIGO, PAOLO VIGLINO, AND GIUSEPPE ROTILIO. Polagraphic Determination of Superoxide Dismutase	1
YU. N. ELKIN, N. I. SHULGA, T. I. VAKORINA, AND A. K. DZIZENKO. Partial Methylation of Methyl Glycosides: A Source of Samples for Analysis of Methylation of Carbohydrate-Containing Compounds	9
N. MARCEAU, R. BLAIS, AND N. BALAUZ. A Practical Design of an Elution System for Preparative Electrophoresis in Polyacrylamide Gel	17
PETER PULKRABEK, KAMIL KLIER, AND DEZIDER GRUNBERGER. Isolation of Poly(A)-Containing RNA on Synthetic Fluorophlogopite (Mica)	26
B. SUGDEN, B. DETROY, R. J. ROBERTS, AND J. SAMBROOK. Agarose Slab-Gel Electrophoresis Equipment	36
E. MENDEZ AND C. Y. LAI. Regeneration of Amino Acids from Thiazolinones Formed in the Edman Degradation	47
BRIAN R. CLARK, RICHARD M. HALPERN, AND ROBERTS A. SMITH. A Fluorimetric Method for Quantitation in the Picomole Range of <i>N</i> ¹ -Methylnicotinamide and Nicotinamide in Serum	54
BERNARD I. WEINSTEIN, NINA BHARDWAJ, AND HENG CHUN LI. A Rapid and Accurate Procedure for Assaying DNA Polymerase, RNA Polymerase, of Ribosome Dependent Protein Synthesis	62
M. T. GISSLOW AND B. C. MCBRIDE. A Rapid Sensitive Collagenase Assay	70
MINOTI SHARMA AND WILSON ROY SLAUNWHITE, JR. Quantitation of Alkyl-amino Side Chains Coupled to Agarose Beads.	79
JÜRGEN HANSEN AND IB MØLLER. Percolation of Starch and Soluble Carbohydrates from Plant Tissue for Quantitative Determination with Anthrone	87
DAVID H. COOMBS. Density Gradient Fractionation by Piston Displacement	95
BJØRN QUISTORFF. A Mechanical Device for the Rapid Removal and Freezing of Liver or Brain Tissue from Unanaesthetized and Nonparalyzed Rats.	102
ANDREW S. BAJKOWSKI AND ALLEN FRANKFATER. Specific Spectrophotometric Assays for Cathepsin B ₁	119
WERNER HENSEL, DAGMAR RAKOW, AND WOLFRAM CHRIST. Convenient Method for Preparation and Purification of Nicotinamide Mononucleotide Analogs	128
GERSON KEGELES AND CHING-HSIA KE. A Light-Scattering Pressure-Jump Kinetics Apparatus	138
PIERRE MORELL, RICHARD C. WIGGINS, AND MARJORY JONES GRAY. Polyacrylamide Gel Electrophoresis of Myelin Proteins: A Caution	148
H. W. CULP, W. D. DANIELS, D. J. PIEPER, G. D. POLLOCK, AND R. W. SANDERS. A Method for Counting Six Gamma Nuclides Simultaneously in a Three Channel Counter	155
D. PERRETT, J. P. W. WEBB, D. B. A. SILK, AND M. L. CLARK. The Assay of Dipeptides using Fluorescamine and its Application to Determining Dipeptidase Activity	161
R. E. CHRISTOPHER AND (IN PART) G. SHEPPARD. The Determination of the Radiochemical Purity of Phosphorus-32 and Tritium-Labeled Diisopropylphosphorofluoridate (DFP)	167
DAVID L. BATES, RICHARD N. PERHAM AND JOHN R. COGGINS. Methods for Obtaining Peptide Maps of Proteins on a Subnanomole Scale.	175
ROBERT F. PUTNINS AND ESTHER W. YAMADA. Colorimetric Determination of Inorganic Pyrophosphate by a Manual or Automated Method	185

COY D. FITCH AND REKHA CHEVLI. Measurement of β -Guanidinopropionate and Phosphorylated β -Guanidinopropionate in Tissues	196
JOANNE E. HESSE, LUCIA B. ROTHMAN-DENES, AND WOLFGANG EPSTEIN. A Convenient Erythrocyte Membrane Cyclic AMP Binding Assay	202
N. VENKATESWARA RAO AND ELIJAH ADAMS. Observations on the Gel Chromatography of Collagen-like Peptides and Use of a Simple Calibration Method for Molecular Weight Determination	209
J. KENNETH HERD AND JANICE TSCHIDA. Detection of Acyl Esterase Activity on Electrophoresis Membranes and Separation from Hyaluronidase	218
J. TOMASZ. One-Dimensional Separation of Nine DNA Bases on Strong Cation-Exchange Thin-Layers	226
KENNETH V. HONN AND WALTER CHAVIN. An Improved Automated Biuret Method for the Determination of Microgram Protein Concentrations	230
JEANINE KLEEMAN AND STANLEY M. PARSONS. A Sensitive Assay for the Reverse Reaction of the First Histidine Biosynthetic Enzyme	236
S. A. SLOCUM AND J. F. STUDEBAKER. Analysis of Enzymatic Steroid Conversions by High Pressure Liquid Chromatography.	242
CARL MONDER AND JOHN KENDALL. Sulfuric Acid-Induced Fluorescence of Corticosteroids: Effects of Position Substituents on Fluorescence	248
G. NICOLAU, S. SHEFER, AND E. H. MOSBACH. Determination of Microsomal Cholesterol by an Isotope Derivative Method.	255
ALEXANDER S. SUN AND BRIAN POOLE. Fractionation of Rat Fibroblasts in a Zonal Rotor by Means of a Viscosity Barrier	260
A. HIROTOSHI NISHIKAWA AND PASCAL BAILON. Lyotropic Salt Effects in Hydrophobic Chromatography.	274
J. N. BURNELL AND F. R. WHATLEY. A New, Rapid, and Sensitive Assay for Adenosine 5'-Phosphosulphate (APS) Kinase	281
R. J. PORRA. A Rapid Spectrophotometric Assay for Ferrochelatase Activity in Preparations Containing Much Endogenous Hemoglobin and Its Application to Soybean Root-Nodule Preparations	289
MICHAEL C. MACLEOD. Uncertainty in the Determination of the Molecular Weight of Poly(A)-Containing RNA.	299
CARL BERNOFSKY. Binding of Purine Nucleotides to Ammonium Formate During Gel Filtration on Sephadex G-10	311

SHORT COMMUNICATIONS

H. PAUL MELOCHE AND CLAIRE T. MONTI. Silver Oxide Oxidation of an Aldehyde with Carbon Tritium Bonds Vicinal to the Carbonyl Carbon	316
D. PARRIS AND S. J. VAN DER WILT. A New Numerical Method for Evaluating the Kramers-Kronig Transformation.	321
W. D. LUST, J. V. PASSONNEAU, AND S. K. CRITES. The Measurement of Glycogen in Tissues by Amylo- α -1, 4- α -1,6-Glucosidase after the Destruction of Preexisting Glucose	328
M. A. JERMYN. Increasing the Sensitivity of the Anthrone Method for Carbohydrate	332
HELEN CHILTON KIEFER, CARL R. JOHNSON, K. L. ARORA, AND HARVEY S. KANTOR. Colorimetric Identification of Prostaglandins in Subnanomole Amounts	336
P. SCOTT POLLOCK AND GEORGE G. GLENNER. An Alternative Method for Removing Low Molecular Weight Proteins from Urea and Guanidine HCl Solutions	341
R. C. NOBLE AND J. H. SHAND. A Simple Method for the Differential Counting of ^{14}C and ^{32}P Using a Polyethylene Minivial	345

NUMBER 2, OCTOBER 1975

YUHSI MATUO, RYUJIRO SANO, TETSUYA TOSA, AND ICHIRO CHIBATA. Purification of Flavin-Adenine Dinucleotide and Coenzyme A on <i>p</i> -Acetoxy-mercurianiline-Agarose Columns	349
J. T. STOKLOSA AND H. W. LATZ. Electrophoretic Behavior of Protein Dodecyl Sulfate Complexes in the Presence of Various Amounts of Sodium Dodecyl Sulfate	358
N. G. ANDERSON, D. D. WILLIS, D. W. HOLLADAY, J. E. CATON, J. W. HOLLEMAN, J. W. EVELEIGH, J. E. ATTRILL, FRANCES L. BALL, AND N. L. ANDERSON. Analytical Techniques for Cell Fractions	371
VESNA A. ETEROVIĆ, RAY G. AUNE, AND EDWARD L. BENNETT. Radioactive Labeling of α -Bungarotoxin with Tritium	394
INGEMAR BJÖRKHEM AND KARL-ERIC KARLMAR. A Novel Technique for Assay of Side-Chain Cleavage of Exogenous and Endogenous Cholesterol in Adrenal-Mitochondrial and Submitochondrial Preparations	404
REINHARD RÜCHEL AND MYLES D. BRAGER. Scanning Electron Microscopic Observations of Polyacrylamide Gels	415
KEITH J. ELLIS AND J. F. MORRISON. A Problem Encountered in a Study of the Effects of Lanthanide Ions on Enzyme-Catalyzed Reactions	429
R. J. FLOWER AND W. O. MCCLURE. A Simple Isotope Derivative Assay for Prostaglandins and Prostaglandin Metabolites	436
TOSHIKAZU HISATA. An Accurate Method for Estimating 5-Phosphoribosyl 1-Pyrophosphate in Animal Tissues with the Use of Acid Extraction	448
CARLO CANNELLA, BERNARDO PENSA, AND LAURA PECCI. Determination of Rhodanese Activity Using a pH-STAT Apparatus	458
DONALD M. KIRSCHENBAUM. Molar Absorptivity and $A_{1\%}^{1\text{cm}}$ Values for Proteins at Selected Wavelengths of the Ultraviolet and Visible Regions. XI	465
FREDERICK VARRICCHIO AND HENRY J. ERNST. Separation of Low Molecular Weight RNA by Polyacrylamide Gel Electrophoresis	485
ZENON SCHNEIDER AND ANDRZEJ GURANOWSKI. Determination of Labeled Adenine by Means of Adsorption on Cellulose Nitrate Filters: A Sensitive Method for Estimation of Nucleosidase Activity	493
HANS WOLF. A Procedure for Simultaneous Preparation of Large Amounts of DNA and RNA by the Use of Potassium Iodide Gradients	505
P. VENKATESWARLU. Determination of Total Fluorine in Serum and Other Biological Materials by Oxygen Bomb and Reverse Extraction Techniques	512
BERALD HOFFMAN. A Rapid Liquid Chromatographic Determination of <i>S</i> -Adenosylmethionine and <i>S</i> -Adenosylhomocysteine in Subgram Amounts of Tissue	522
L. M. LEWIN, A. PESHIN, AND B. SKLARZ. A Gas Chromatographic Assay for Carnitine	531
ROLF F. KLETZIEN, MICHAEL W. PARIZA, JOYCE E. BECKER, AND VAN R. POTTER. A Method Using 3- <i>O</i> -Methyl-D-Glucose and Phloretin for the Determination of Intracellular Water Space of Cells in Monolayer Culture	537
JULIAN A. PETERSON AND DONALD M. MOCK. Dual Wavelength/Stopped Flow Spectrophotometry: Computer Acquisition and Analysis	545
C. J. LAMB AND P. H. RUBERY. A Spectrophotometric Assay for <i>Trans</i> -Cinnamic Acid 4-Hydroxylase Activity	554
C. F. SAVOY, J. L. HEINIS, AND R. G. SEALS. Improved Methodology for Rapid and Reproducible Acid Hydrolysis of Food and Purified Proteins	562
V. GORDON CREWETHER AND ADAM S. INGLIS. Automatic Procedures for Determining Amino Acid Sequences of Peptides	572

JOHN F. BLAZYK, DONALD L. MELCHIOR, AND JOSEPH M. STEIM. An Automated Differential Scanning Dilatometer	586
M. MANCHA, G. B. STOKES, AND P. K. STUMPF. Fat Metabolism in Higher Plants. The Determination of Acyl-Acyl Carrier Protein and Acyl Coenzyme A in a Complex Lipid Mixture	600
JOHANNES H. WASSINK AND STEPHEN G. MAYHEW. Fluorescence Titration with Apoflavodoxin: A Sensitive Assay for Riboflavin 5'-Phosphate and Flavin Adenine Dinucleotide in Mixtures.	609
H. T. HUTCHISON AND B. HABER. Estimation of Parameters in Double Uptake Systems	617
PAUL T. CHIEN AND LESLIE W. MICHAEL. Assay of Proteolytic Enzyme with a Leucine-Selective Electrode	620

SHORT COMMUNICATIONS

KATSUKO SUHARA, SHIGEKI TAKEMORI, MASAYUKI KATAGIRI, KEISHIRO WADA, HIROKO KOBAYASHI, AND HIROSHI MATSUBARA. Estimation of Labile Sulfide in Iron-Sulfide Proteins	631
G. D. SMITH AND L. W. NICHOL. A Sedimentation Procedure for the Detection of Binding of Concanavalin A and Heparin to Lipoproteins	633
JOSE MADRID CONCON. Interference of Ethanol in the Determination of Tryptophan by the Method of Spies and Chambers	642
ALFREDO MORENO, CARMEN G. VALLEJO, ANTONIO SILLERO, AND MARÍA A. G. SILLERO. Wide Occurrence of Guanosine 5'-Tetraphosphate in Commercial Preparations of GTP	644
RICHARD H. TURNER AND IRVIN E. LIENER. The Use of Glutaraldehyde-Treated Erythrocytes for Assaying the Agglutinating Activity of Lectins	651
ROBERT W. EGAN. A General Method for Quantitative Separation of Prostaglandins by Paper Chromatography.	653
KENNETH OLSON AND L. L. HOUSTON. An Inexpensive, Efficient Filtering Manifold	655
K. C. INGHAM. On the Application of Job's Method of Continuous Variation to the Stoichiometry of Protein-Ligand Complexes	660
H. SØLLING AND V. ESMANN. A Sensitive Method of Glycogen Determination in the Presence of Interfering Substances Utilizing the Filter-Paper Technique	666
JOHN W. GORDON AND H. WEIL-MALHERBE. 5-Hydroxyindole Acetic Acid Methyl Ester: A Possible Artifact Arising in the Method of Lindqvist	691
ERRATA	671
AUTHOR INDEX	671

Subject Index for Volume 68 will appear in the December 1975 issue as part of a cumulative index for the year 1975.